Palo Verde Ecological Reserve

Restoration Development Plan

Restoration Plan: Phase 1- Native Plant Nursery

February 2006

Introduction

The Lower Colorado River Multi Species Conservation Plan (LCR MSCP) was developed to comply with the Endangered Species Act and is a coordinated, comprehensive, long-term multi-agency (Federal and non-Federal) effort to conserve and work toward the recovery of threatened and endangered species, and protect and maintain wildlife habitat on the lower Colorado River. The LCR MSCP partnership intends to accomplish this through the implementation of a 50-year Habitat Conservation Program HCP. This project will be a component of the LCR MSCP for which Reclamation is the implementing entity.

The overall goal for the Palo Verde Ecological Reserve (PVER) is to develop and maintain riparian habitat that will contribute to the habitat objectives outlined in the HCP.

The restoration of native habitat at PVER has been phased over a nine year period (figure 1). The initial phase will be the development of a native riparian nursery.

Restoration Plan: Phase 1

Purpose/Need

The purpose of the nursery is to provide riparian and upland plant material for future riparian restoration at PVER. The vegetation species that will be planted in the nursery are used by the covered species listed in the LCR MSCP HCP in a riparian habitat environment. Riparian habitats include a mosaic of vegetation species including ground covers, trees and shrubs.

The riparian nursery will encompass 20 acres of field 15 and 10 acres of a portion of field 16 will be planted for upland vegetation (figure 2).

Design/Planting Plan

The proposed riparian nursery design will be as follows (figure 3):

- 6 acres planted with *Salix exigua* (coyote willow) 20’ on center for a total of 660 trees
- 6 acres planted with *Salix gooddingii* (Gooddings willow) 20’ on center for a total of 660 trees

- 6 acres planted with *Populus fremontii* (Fremont cottonwood) 20’ on center for a total of 660 trees
- 2 acres planted with *Baccharis sarothroides* (Desertbroom) 20’ on center for a total of 220 shrubs

The proposed upland nursery design will be as follows (figure 3):

- 6 acres planted with *Prosopis glandulosa v. torreyanna* (Honey mesquite) 20’ on center for a total of 660 trees
- 1 acre planted with *Baccharis salicifolia* (Mule’s fat) 20’ on center for a total of 110 shrubs
- 1 acre planted with *Atriplex lentiformis* (Quailbush) 20’ on center for a total of 110 shrubs
- 1 acre planted with *Atriplex canescens* (Four wing saltbush) 20’ on center for a total of 110 shrubs
- 0.5 acre planted with *Atriplex polycarpa* (Cattle saltbush) 20’ on center for a total of 50 shrubs
- 0.5 acre planted with *Encelia farinosa* (Brittlebush) 20’ on center for a total of 50 shrubs
- 10 acre understory of *Distichlis spicata* (inland saltgrass) 1’ in line spacing with 38” rows.

Planting/Techniques

The planting techniques that will be used for Phase I include; automated mass planting for the Distichlis spicata and a conventional tree planter for the trees and shrubs.

At the present time field 15 is planted in alfalfa. The alfalfa will remain, left to grow and serve as a ground cover to help eliminate invasive non native species. Approximately 5 foot wide rows will be disked through the alfalfa in preparation for planting the trees and shrubs. Plugs of native salt grass (*Distichis spicata*) will be planted in the upland nursery employing the automated mass planting technique in 1 foot in-line spacing with row width of 38 inches between the shrubs and trees of the upland nursery. The salt grass will serve as a cover crop and a seed/plug collection site.

Grading

Grading will consist of laser leveling for planting. Berms may be added for efficient deliver of water. Contouring will not be done in the nursery at this time.

Irrigation

The anticipated schedule for the riparian nursery will be as follows; immediately after planting and then once a week for 4 weeks, followed by every 10-14 days through September, and then once a month only in October and November for the first growing season. No irrigation in the months of December, January and February. The schedule may be adjusted in the first growing season.

The upland nursery irrigation schedule is as follows; immediately post planting of trees and shrubs, immediately after auotmated mass planting of Distichlis spicata, then every 3-4 days for three weeks, followed by every week for one month and then once every three weeks through September for the first season. No irrigation October, November, December, January, and February. This schedule may also be adjusted according to the plant needs.

Monitoring

Phase 1 shall be used as a nursery providing seeds and cuttings and will not be submitted for mitigation credit, therefore, monitoring will not occur for covered species. The purpose of the monitoring plan for Phase 1 is to monitor survivorship of the planted materials with the exception of *Distichlis spicata* in the upland nursery, which will not be monitored as it is a cover crop. The riparian and the upland nursery will be monitored in exactly the same manner.

Survivorship monitoring will be separated into two equally monitored categories: (1) initial survivorship conducted 4-6 weeks after planting and (2) over-summer survivorship conducted during the non-growing season (Oct.-Jan.). All planted trees and shrubs will be identified, counted, and health determined as live, dead, or stressed in order to determine survivorship and general health. Live shall be defined as containing leaves and non-brittle branches. Dead shall be defined as containing no leaves and brittle to the touch. Stressed shall be defined as containing a few leaves and branches not brittle to the touch. Newly recruited and invasive trees and shrubs will not be counted.

Starting the year after the initial planting year, trees and shrubs shall be observationally monitored during the non-growing season. Trees and shrubs shall be visually assessed as to re-growing or not re-growing after they have been cut for stock to be used in future phases.

Figure 1. PVER Phase Plan 1-9

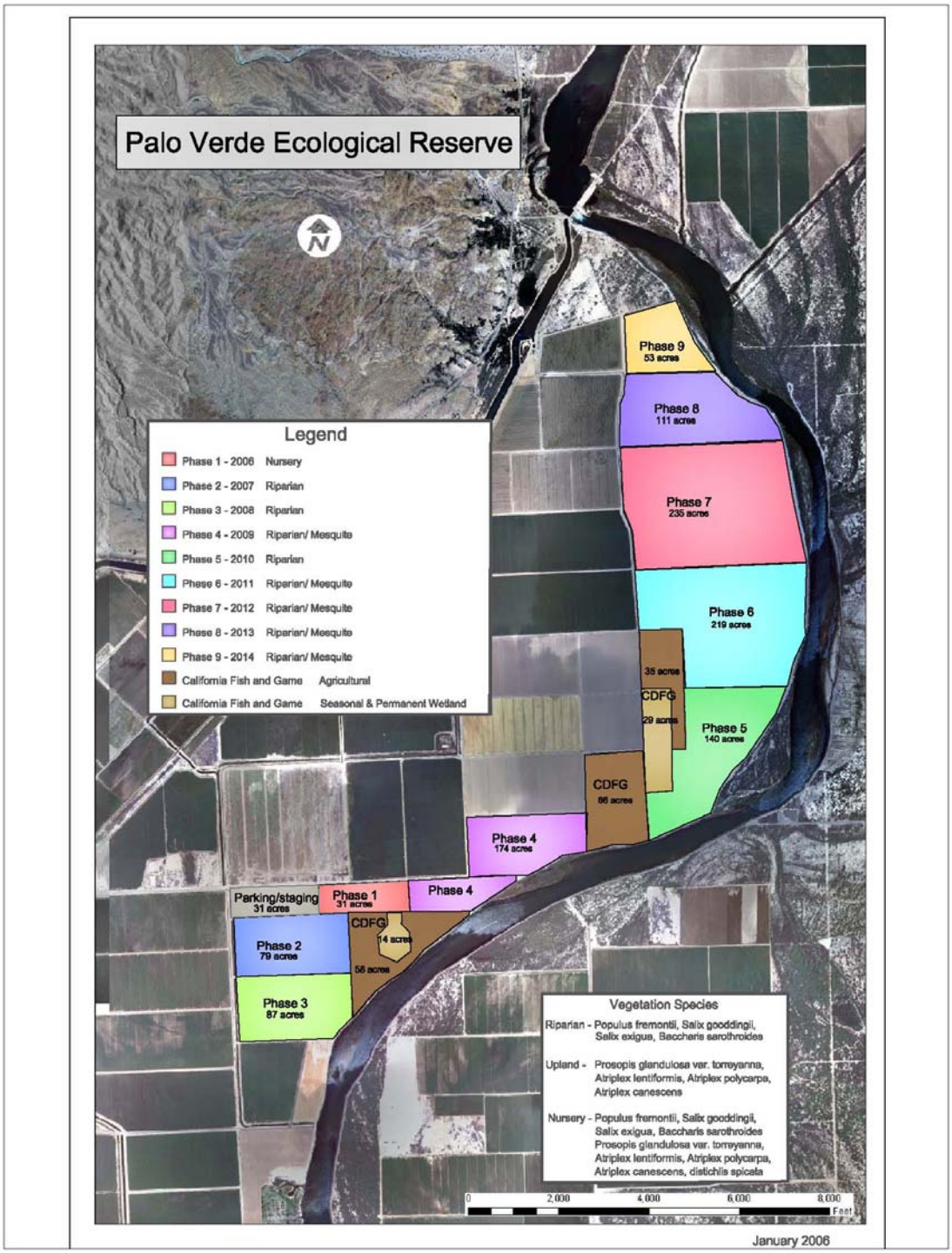
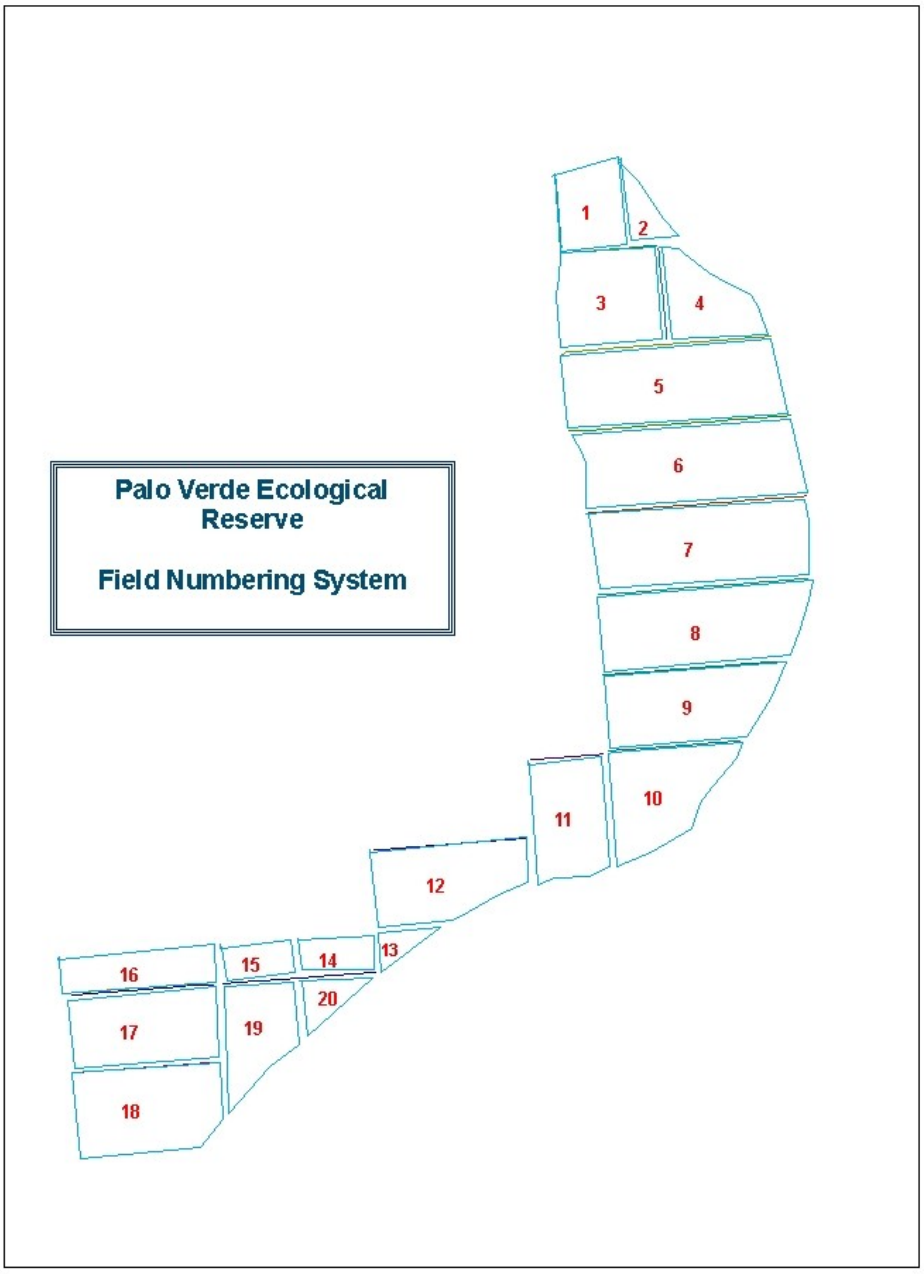
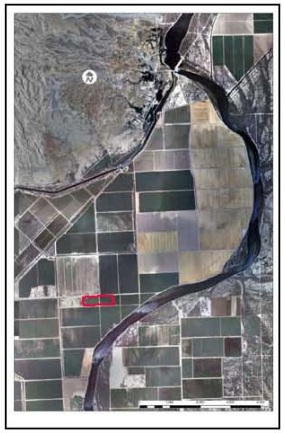
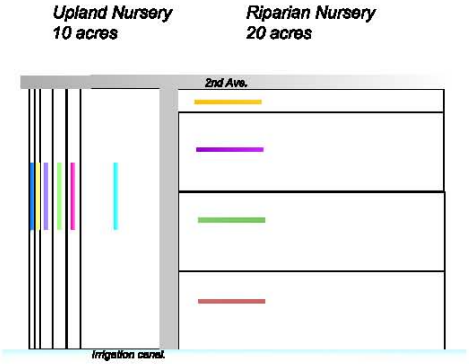


Figure 2. CDFG Field Numbering System



Palo Verde Ecological Reserve Nursery Planting Plan





Symbol	Scientific Name	Common Name	Total Number	Feet on center	Acres
	Salix exigua	Coyote willow	660	20	6.0
	Salix gooddingii	Goodding's willow	660	20	6.0
	Populus fremontii	Fremont cottonwood	660	20	6.0
	Baccharis sarothroides	Desertbroom	220	20	2.0
	Prosopis glandulosa v. torreyana	Honey mesquite	660	20	6.0
	Baccharis salicifolia	Mule's fat	110	20	1.0
	Atriplex lentiformis	Quailbush	110	20	1.0
	Artiplex canescens	Four wing saltbush	110	20	1.0
	Atriplex polycarpa	Cattle saltbush	50	20	0.5
	Encelia farinosa	Brittlebush	50	20	0.5

November 2005

Figure 3. Phase 1: Nursery Planting Plan